

# HW 3.2

pp. 132 2 – 6 even, 7 – 12 all, 14, 16



**Factor the expression.**

$$2. \quad x^3 + 18x^2 + 108x + 216$$

$$= x^3 + 3x^2(6) + 3x(6)^2 + (6)^3$$

$$(x + 6)^3$$



Factor the expression.

$$x = 3x$$

$$y = 1$$

$$4. \quad 27x^3 + 27x^2 + 9x + 1$$

$$= (3x)^3 + 3(3x)^2(1) + 3(3x)(1)^2 + (1)^3$$

$$(3x + 1)^3$$

**SPECIAL PRODUCT PATTERNS**

$$(x + y)^3 = x^3 + 3x^2y + 3xy^2 + y^3$$

$$(x - y)^3 = x^3 - 3x^2y + 3xy^2 - y^3$$

$$6. \quad 729x^3 - 486x^2 + 108x - 8$$

$$(9x)^3 - 3(9x)^2(2) + 3(3x)(2)^2 - (2)^3$$

$$(9x - 2)^3$$

$$x = 9x$$

$$y = 2$$



**Match the polynomial with the appropriate factorization.**

7.  $32x^2 - 24x^2 + 6x - \frac{1}{2}$

8.  $\frac{1}{2}x^3 + 6x^2 + 24x + 32$

9.  $\frac{1}{2}x^3 - 6x^2 + 24x - 32$

A.  $\frac{1}{2}(x - 4)^3$

B.  $\frac{1}{2}(4x - 1)^3$

C.  $\frac{1}{2}(x + 4)^3$



10.  $125x^3 - 225x^2 + 135x - 27$

a.  $(3x - 5)^3$

b.  $(5x - 3)^3$

c.  $(3x + 5)^3$

d.  $(5x + 3)^3$

**Factor the expression.**

$$14. \quad 64x^3 + 240x^2y + 300xy^2 + 125y^3$$

$$= (4x)^3 + 3(4x)^2(5y) + 3(4x)(5y)^2 + (5y)^3$$

$$(4x + 5y)^3$$



**16. Geometry** The diagram at the right shows a cube shaped tissue box and an expression for its volume.

- a. Find a binomial that represents an edge length of the tissue box.
- b. Write an expression for the surface area of the tissue box.
- c. If  $x$  is 4 centimeters, what is the surface area of the tissue box?



Volume:  
 $27x^3 - 27x^2 + 9x - 1$

a.  $(3x)^3 - (3x)^2(1) + (3x)(1)^2 - (1)^3$

$(3x - 1)^3$       So each side is  $(3x - 1)$

b.  $6(3x - 1)^2$

c.  $6[3(4) - 1]^2$

$6(12 - 1)^2$

$6(11)^2$        $6(121) = 726\text{cm}^2$

